

3. Notes on Entozoa.—Part IV. By T. SPENCER COBBOLD, M.D., F.R.S., F.L.S., Correspondent of the Academy of Sciences of Philadelphia.

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(Plate XXI.)

The present series comprises a variety of new and interesting parasites, all of them belonging to the Nematode Order.

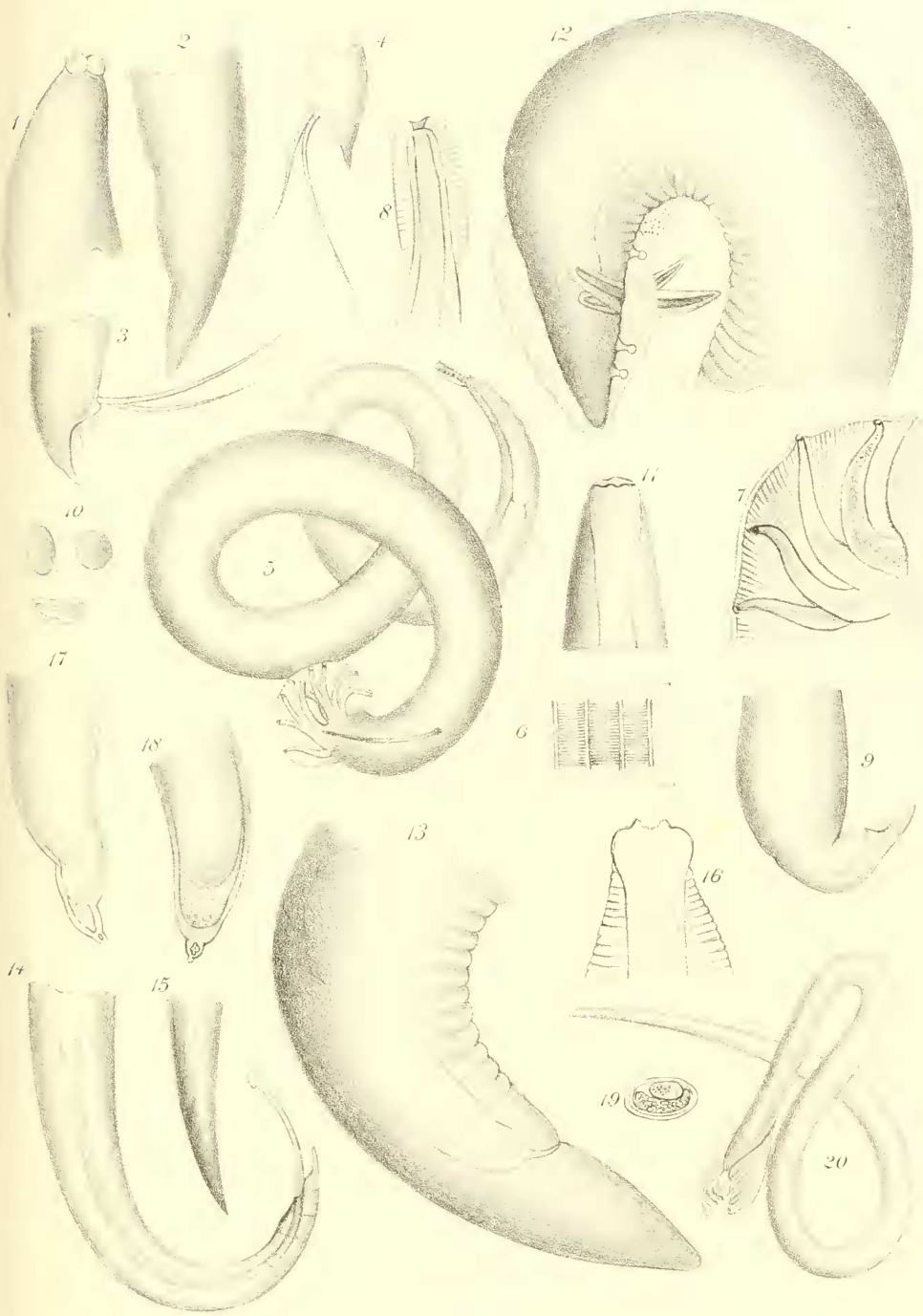
12. ASCARIS CORNELYI, nov. sp. (Plate XXI.)

On the 21st of December, 1875, I was requested to identify a nematoid which Mr. Selater had only a few days previously received from Mr. J. M. Cornely, C.M.Z.S. As stated on the label of the bottle, the worms had been removed from the intestines of a Vulturine Pintado (*Numida vulturina*). At once making a pocket-lens examination of the parasites, I remarked that the species was probably new to science; and on the 30th of the same month this opinion was confirmed by careful investigation. In a more or less marked manner its characters differed from allied forms infesting fowls and game birds (such as *Ascaris compar*, *A. perspicilla*, *A. inflexa*, &c.); consequently I have ventured to name the worm *A. cornelyi*, after the discoverer. The bottle contained eleven specimens in all, eight of them being of the male sex. I think the worms must have been unduly shaken during transmission; for not only were they coiled together in a very complicated way, but at least three of the males had their exerted spicules broken. From the best examples I gathered the following diagnostic characters:—Head entirely naked and destitute of appendages, the dorsal lip being conspicuously larger than either of the two ventral lips; body much contorted and rather suddenly narrowed at either end, especially towards the head in the female; tail of the male appearing diagonally abrupt when seen in profile, and furnished with a sharply pointed subulate process at the tip, also presenting on either side a feebly developed but distinctly four-lobed membrane; spicules two in number, long and slender, unequal, the exerted portion of the longer one measuring fully $\frac{1}{5}$ of an inch; tail of the female with an ensiform profile, sharply pointed and furnished with an extremely minute, distinct but scarcely separable process at the tip. Males up to $\frac{3}{4}$ of an inch in length, the females being very nearly an inch long, with a breadth of $\frac{1}{5}$ of an inch.

Of the accompanying figures, two of them illustrate the characters of the head and tail of a female worm, whilst the others show respectively right and left profile views of the tail of the male as exhibited by the two most perfect specimens (Plate XXI. figs. 1–4). The arrangement of the spicules in the fourth figure is clearly the result of artificial twisting.

13. STRONGYLUS HEMICOLOR, nov. sp. (Plate XXI.)

Nearly ten years back I received a batch of parasites from the



Zoological Gardens. Some of these have been described in the Society's 'Proceedings;' and others have been publicly noticed elsewhere in a less formal manner.

Amongst the series in question was a bottle that contained three different species of nematoid parasites, all derived from one and the same host. The infested animal was a Lemur (*Pithecia leucocephala*) which appears to have died at the Gardens on the 28th of June, 1866. The worms were of three well-marked sizes. The largest species, represented by a single parasite and measuring $8\frac{1}{2}$ inches long, could not be distinguished from the ordinary *Ascaris lumbricoides* of the human subject. It had been removed by Dr. Murie from the rectum.

The worms of intermediate size, numbering in all eleven specimens, were taken from the stomach and œsophagus; six of these were males averaging from an inch to an inch and a quarter in length. The five females varied from $1\frac{1}{2}$ " to 2" in length. A pocket-lens examination at first suggested that they were examples of *Spiroptera dilatata* (a species that is common in the South-American Monkeys); but I have since determined otherwise. The smallest set of parasitic worms from the Lemur, of which there were no less than forty-four specimens in the bottle, proved to be new to science. These had been removed from the small intestine. In the condition in which I received them they were each thrice or four times coiled upon themselves, reminding one of the appearance so often seen in the encapsuled nematodes of fishes. After my original brief examinations, I put all the worms aside for future study; and it was not until the 16th of April, 1873, that I found the necessary leisure to work out the general structure of these elegant little parasites. Their minute size rendered them eminently favourable for microscopic examination; and in this way I obtained evidence of the existence of several peculiarities that I had not hitherto encountered amongst the nematodes. The following characters will form a ready means of identification:—Head well marked and furnished with a transversely striated bilateral membrane which projects beyond and contributes to the formation of the mouth; oral aperture simple and continuous with a long and moderately narrow œsophagus; body decidedly attenuated in front and almost uniformly thickened behind, its surface being marked by 12 or 14 conspicuous lines, forming in profile slightly raised parallel ridges extending from one end to the other; tail of the female suddenly narrowed to a conical point, the arms being placed within a very short distance of its extremity; tail of the male furnished with a large circular and apparently undivided hood, supported by ten rays; spicule solitary and rather long. Males only $\frac{1}{5}$, and females only $\frac{1}{4}$ of an inch in length.

In addition to the above diagnosis I may add that I have named the species *hemicolor*, from the circumstance that the anterior half of the body in nearly all the specimens was a shade darker in colour than the posterior half. I have illustrated the structure of the worm by five figures. One of these affords a general view of the male parasite naturally coiled upon itself (Plate XXI. fig. 5). The longitu-

dinal lines are not represented here ; but they are separately shown in figure 6, where the quarter-inch glass also brought into view numerous transverse striæ between the ridges. Alterations of the focus, however, served to show that the transverse lines were continuous and not interrupted by the longitudinal lines. I am under the impression that these lines are due to the presence of water-vascular canals, but could not demonstrate the existence of a lumen with certainty. Another illustration shows part of the bursa highly magnified (fig. 7). The tubular character of the rays, with their finely granular contents, was well seen, the bursal membrane being itself marked by a series of perfectly distinct striæ radiating from the base to the outspread margin, the latter being distinctly bordered by a thin extension of the cuticular layer. In another drawing I have represented an enlarged view of the head of the male (fig. 8) ; and I have also given (fig. 9) a less magnified view of the tail of the female.

14. SPIROPTERA MURIEI, NOV. SP. (Plate XXI.)

The eleven nematodes above mentioned as being of intermediate size I have also determined to be new to science. As already stated, they were removed by Dr. Murie from the stomach and œsophagus of the Lemur (*Pithecia leucocephala*). The following characters will be sufficiently diagnostic in view of future identifications:—Head simple and unarmed, the mouth being bordered by six very slightly elevated papillæ; body uniform in thickness, but suddenly narrowed at either end, both sexes presenting a conspicuous gland opening at the ventral surface, about $\frac{1}{20}$ of an inch below the oral margin; tail of the male strongly curved, sharply pointed, and furnished with broad lateral folds, each about $\frac{1}{16}$ " in length; spicules two, scimitar-shaped, remarkably stout and short, the larger measuring not more than $\frac{1}{30}$ " lengthways; tail of the female comparatively blunt, the anus being placed about $\frac{1}{24}$ " from the tip. Males up to $1\frac{1}{4}$ "; females $1\frac{1}{2}$ " to 2 " long.

The accompanying Plate (figs. 11–13) supplies three illustrations of this worm, showing all the more essential characters above described, and likewise, in addition, the presence of a supplementary caudal appendage in the male, besides several stalked gland-duets connected with the lateral membranes.

15. ASCARIS ANDERSONI, NOV. SP. (Plate XXI.)

On the 27th of September, 1875, I received a small parcel containing entozoa from Dr. John Anderson; and I was informed by letter that all the parasites had been obtained by the donor from hosts occupying the north-eastern province of India.

In the series in question there were six examples of a small nematode removed from the cæcum of a squirrel (*Sciurus*—?). Two of the specimens were males, four being females. Believing them to represent a new species, I append the following diagnostic characters:—Head simple, unarmed; body finely drawn out in front and sharply pointed behind in both sexes; tail of the male furnished with a minute oval-shaped spine at the tip, also with two long arcuate spi-